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EXAMINER	
GROSS, KENNETH A	

ART UNIT	PAPER NUMBER
2122	20

DATE MAILED: 03/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/552,292	ROBISON, ARCH D.	
	Examiner	Art Unit	
	Kenneth A Gross	2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 10-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 10-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 10, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over "How Debuggers Work", Jonathan B. Rosenberg, 1996 (hereinafter Rosenberg) in view of Wallace et al. (U.S. Patent Number 6,018,799) and further in view of Lo et al. (U.S. Patent Number 6,151,706).

In regard to Claim 1, Rosenberg teaches the well-known concept of the 'program stack', which keeps track of addresses and local variables. Rosenberg teaches: (A) as the program is executing, the state of the stack is analyzed by 'unwinding' the stack at breakpoints to find the current state of the stack (page 136, lines 26-32); (B) partitioning the stack at each point into records or 'frames' that can be set separately (page 136, lines 25-26); (C) Rosenberg teaches storing addresses and variables on the stack, which is done with a push or similar command for storing information onto a stack (page 137, lines 28-32). These 'push' commands sets a component, or frame, of the stack by pushing information (such as addresses and variables) onto the stack, updating the state of the stack. Rosenberg does not specifically teach that the operations are inserted into the program, nor does he teach that the operations assure that the data structure will be in an accurate state at selected program points. Wallace, however, does teach inserting instructions into a program in order to update the state of the stack, hence ensuring that

[redacted]he stack is in a correct state at selected program points (Column 13, lines 2-17). Neither Rosenberg nor Wallace teaches eliminating partial redundancy by placing the operations stated in step (C) into the code. Lo, however, does teach removing partial redundancy by rearranging code (Column 3, lines 23-35). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to analyze the state of a data structure at different program points, where the structure state is broken up into components and set with instructions, as taught by Rosenberg, where the instructions are placed in the program and the operations assure that the data structure will be in an accurate state at selected program points, as taught by Wallace, and then placing the set instructions in the code so as to eliminate partial redundancy, as taught by Lo, since this would allow for a more optimized program overall.

In regard to Claim 10, Rosenberg teaches the well-known concept of the 'program stack', which keeps track of addresses and local variables. Rosenberg teaches: (A) as the program is executing, the state of the stack is analyzed by 'unwinding' the stack at breakpoints to find the current state of the stack (page 136, lines 26-32); (B) partitioning the stack at each point into records or 'frames' that can be set separately (page 136, lines 25-26); (C) Rosenberg teaches storing addresses and variables on the stack, which is done with a push or similar command for storing information onto a stack (page 137, lines 28-32). These 'push' commands sets a component, or frame, of the stack by pushing information (such as addresses and variables) onto the stack, updating the state of the stack. Rosenberg does not specifically teach that the operations are inserted into the program, nor does he teach that the operations assure that the data structure will be in an accurate state at selected program points. Wallace, however, does teach inserting instructions into a program in order to update the state of the stack, hence ensuring that

the stack is in a correct state at selected program points (Column 13, lines 2-17). Neither Rosenberg nor Wallace teaches computing placement of said operations to eliminate partial redundancy and inserting the set of operations and computed placements. Lo, however, does teach computing placement of code through a series of code motions in order to eliminate partial redundancy (Column 2, lines 10-29). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to analyze the state of a data structure at different program points, where the structure state is broken up into components and set, as taught by Rosenberg, where the instructions are placed in the program and the operations assure that the data structure will be in an accurate state at selected program points, as taught by Wallace, and then computing placement of the set instructions in the code so as to eliminate partial redundancy and placing the set instructions in the code according to the computed placement, as taught by Lo, since this would allow for a more optimized program overall.

Claim 13 is a medium Claim that corresponds with Claim 10 and is rejected for the same reasons as Claim 10, where Lo teaches a medium to carry out said method (Figure 11).

For logic behind the rejections of Claims 2 and 14, see the office action mailed on November 14th, 2003.

3. Claims 3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over "How Debuggers Work", Jonathan B. Rosenberg, 1996 (hereinafter Rosenberg) in view of Wallace et al. (U.S. Patent Number 6,018,799) and further in view of Lo et al. (U.S. Patent Number 6,151,706) and Gordon et al. (U.S. Patent Number 6,507,805).

For logic behind the rejections of Claims 3 and 15, see the office action mailed on November 14th, 2003.

4. Claims 4, 5, 11, 12, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over "How Debuggers Work", Jonathan B. Rosenberg, 1996 (hereinafter Rosenberg) in view of Lo et al. (U.S. Patent Number 6,151,706) and further in view of Dunn et al. (U.S. Patent Number 6,247,172).

For logic behind the rejections of Claims 4, 5, 11, 12, 16, and 17, see the office action mailed on November 14th, 2003.

5. Claims 6 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over "How Debuggers Work", Jonathan B. Rosenberg, 1996 (hereinafter Rosenberg) in view of Lo et al. (U.S. Patent Number 6,151,706) and further in view of Dunn et al. (U.S. Patent Number 6,247,172) and Gordon et al. (U.S. Patent Number 6,507,805).

For logic behind the rejections of Claims 6 and 18, see the office action mailed on November 14th, 2003.

Response to Arguments

6. Applicant's arguments with respect to claims 1, 10, and 13 have been considered but are moot in view of the new ground(s) of rejection.

Specifically, applicant has amended Claims 1, 10, and 13 to include limitations requiring that the operations that set the components to be inserted into the program, and that the operations assure that the data structure will be in an accurate state at the selected program points. The applicant states that neither Rosenberg, nor, Lo, nor Gordon, nor Dunn teach these limitations, so therefore the claims are in condition for allowance. However, in the rejection

above, Wallace teaches these new limitations, and therefore the claims remain rejected, and are not in condition for allowance.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth A Gross whose telephone number is (703) 305-0542. The examiner can normally be reached on Mon-Fri 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q Dam can be reached on (703) 305-4552. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KAG

TUAN DAM
SUPERVISORY PATENT EXAMINER